

BULLETIN

OF THE INSTITUTE OF METALS

VOLUME 3

NOVEMBER 1955

PART 3

INSTITUTE NEWS

President and Secretary Honoured

On the occasion of the recent Joint Metallurgical Societies Meeting in Europe, the Institute's President, Dr. MAURICE COOK, F.I.M., and the Secretary, Lieut.-Colonel S. C. GUILLAN, T.D., were elected Honorary Life Members of the American Institute of Mining and Metallurgical Engineers and of the American Society for Metals.

Monograph No. 3: "Atomic Theory for Students of Metallurgy"

A new printing is now available of Monograph No. 3: "Atomic Theory for Students of Metallurgy," by Dr. W. Hume-Rothery. This printing incorporates a number of revisions which have resulted in an increase in length of 10 pages.

The monograph, which first appeared in 1946, is now a standard text-book in many universities and colleges. Copies may be obtained at the following prices (post free):

Members (one copy only)	15s. od. (\$2.50)
Non-members	30s. od. (\$4.50)
Libraries	25s. od. (\$3.75)

Annotated Equilibrium Diagrams

Six further systems have recently been included in the Institute's series of Annotated Equilibrium Diagrams. They are:

- No. 13. The Aluminium-Iron System.
- No. 14. The Aluminium-Tin System.
- No. 15. The Aluminium-Antimony System.
- No. 16. The Aluminium-Silicon System.
- No. 17. The Aluminium-Manganese System.
- No. 18. The Aluminium-Nickel System.

All have been prepared by Mr. H. W. L. PHILLIPS, M.A., F.R.I.C., F.Inst.P., F.I.M., of The British Aluminium Co., Ltd.

The diagrams may be obtained from the Institute at the following prices (post free):

Members (one copy only)	1s. od. (\$0.40)
Non-members	2s. od. (\$0.50)
Libraries	1s. 8d. (\$0.40)

Election of Members

The following 13 Ordinary Members and 7 Student Members were elected on 16 September 1955:

As Ordinary Members

- ALPERIN, Bernard J., S.B., Metallurgist (Non-Ferrous), General Electric Co., 2901 East Lake Road, Erie 1, Penna., U.S.A.
- BAILE, Robert Lewis James, Engineering Inspector, Sui Gas Purification Plant Project, Sui Gas Transmission Co., Ltd., P.O. Box 4813, Karachi, West Pakistan.
- BURNETT, Alan, A.I.M., Metallurgist, Low Moor Alloy Steel, Ltd., Low Moor, near Bradford.
- COPE, Robert Edge, B.S., Manager, Permanent Mould Casting Division, Michigan Wheel Co., Grand Rapids, Mich., U.S.A.
- GREEN, E. F., M.S., Chief Metallurgist, Axelson Manufacturing Co., Division of U.S. Industries, Inc., P.O. Box 58335, Vernon Station, Los Angeles 58, Calif., U.S.A.
- HOUGHTON, Francis John, B.Met., Technical Sales Representative, Pickford, Holland and Co., Ltd., 381 Fulwood Road, Sheffield 10.
- MULLIN, John Francis, Plant Metallurgist, General Cable Corp., 1000 Mill Street, Rome, N.Y., U.S.A.
- PETTO, Peter J., Jr., B.S., Vice-President, Arrow Aluminum Castings Co., 3135 Berea Road, Cleveland 11, Ohio, U.S.A.
- PIÑERO, Raúl Argentino, Manufacturer's Representative, Casilla Correo 1400, Buenos Aires, Argentina.
- PREECE, William H. S., S.B., Supervisor of Methods, New Bedford Division, Revere Copper and Brass, Inc., 24 N. Front Street, New Bedford, Mass., U.S.A.
- ROWLAND, Elbert S., Ph.D., M.S., Technical Library, Steel and Tube Division, The Timken Roller Bearing Co., Canton 6, Ohio, U.S.A.
- SANDERSON, John Emmel, A.B., B.L.S., Librarian, Vanadium Corp. of America, P.O. Box 209, Cambridge, Ohio, U.S.A.
- SHAW, Bernard, Chemist, Ford Motor Co., Ltd., Dagenham, Essex.

As Student Members

- ADDERLEY, David Jefferson, Student, Department of Metallurgy, University of Birmingham.
- EL-ANSARI, Rafik Sahib, Student, Department of Metallurgy, University College, Swansea.
- HAYWARD, Elwyn Ronald, B.Sc., Research Student, Department of Metallurgy, University College, Swansea.

O'HANLON, John Kemp, Metallurgist, Research Department, Dorman Long and Co., Ltd., Newport Works, Middlesbrough.

POWELL, Derek, Laboratory Assistant, Henry Wallworks and Co., Ltd., Henry Street, Red Bank, Manchester.

SMITH, Ronald, B.Met., Research Student, Metallurgy Department, University of Sheffield.

SOMMER, Alfred Walter, Student in Metallurgy, University of Pennsylvania.

PERSONAL NOTES

DR. R. M. BRICK has been appointed Director of the Department of Metallurgy of the Central Research and Engineering Division of the Continental Can Company, New York. He was previously Director of the School of Metallurgical Engineering at the University of Pennsylvania, Philadelphia.

MR. R. N. BRUMMITT has taken a post as Research Metallurgist with the Rhoanglo Mines Services, Ltd., Kitwe, Northern Rhodesia.

MR. J. A. CARVER has left Birmingham University and taken up an appointment with the English Steel Corporation, Ltd., Sheffield.

MR. A. CHAMBERLAIN has been appointed Secretary and Research Officer of the Admiralty-Vickers Gearing Research Association, Barrow-in-Furness.

MR. E. R. DAVIES has left the Aluminium Wire and Cable Co., Ltd., Swansea, and taken a post with the U.K. Atomic Energy Authority, Risley.

MR. O. J. DUNMORE has been awarded the Ph.D. degree of Cambridge University and has joined the Research Department of Hadfields, Ltd., Sheffield.

MR. L. G. EARLE, until recently Refineries Manager at the Melton Works of Capper Pass and Son, Ltd., has joined Campbell, Gifford and Morton, Ltd., consulting engineers of Weybridge, as a Director.

DR. U. R. EVANS has been awarded the Palladium Medal of the Electrochemical Society. The presentation took place on 11 October at a banquet held in connection with the autumn meeting of the Society in Pittsburgh, Pa.

MR. R. W. FLOYD has left The Mond Nickel Co., Ltd., and joined High Duty Alloys, Ltd., Slough, as Head of the Metallographic Department.

MR. R. FORSCHER has taken up an appointment with the Canadian Copper Refiners, Ltd., Montreal.

MR. H. C. HARDWICK is now at the General Electric Co., Ltd. (Lamp Works), North Wembley.

MR. A. D. HOPKINS has left the G. K. N. Group Research Laboratory, Wolverhampton, and is now with Imperial Chemical Industries, Ltd., Oldbury, Birmingham.

DR. L. B. HUNT, Manager of the Industrial Division of Johnson, Matthey and Co., Ltd., has been appointed a director of Mallory Metallurgical Products, Ltd.

PROFESSOR DR. W. KÖSTER has been made an Honorary Member of the Instituto del Hierro y del Acero, Madrid.

DR. J. R. LANE has been appointed Staff Metallurgist to the Materials Advisory Board of the Division of Engineering and Industrial Research of the U.S. National Research Council, Washington, D.C.

MR. R. MELLOR has left the South Wales Aluminium Co., Ltd., and is now Technical Manager of Invicta Foil, Cheswright and Nickolls, Ltd., Barking, Essex.

MR. G. J. METCALFE has relinquished his post in the Precious Metals Division of The Mond Nickel Co., Ltd., and taken a position with High Duty Alloys, Ltd., Slough.

MR. D. H. POLONIS has left the University of British Columbia, where he has been a graduate student, and has been appointed Assistant Professor of Metallurgical Engineering at the School of Mineral Engineering, University of Washington, Seattle, Wash.

MR. N. B. RUTHERFORD has been appointed Senior Metallurgist to British Oxygen Engineering, Ltd., *not* Chief Metallurgist as stated in the September issue of the *Bulletin*.

MR. E. A. SHIPLEY has been appointed Chief Chemist and Metallurgist, Nuffield Central Research Laboratories, Coventry, in succession to Mr. R. J. Brown.

DR. R. J. STOKES has left England and is now at the Department of Metallurgy, University of California, Berkeley, Calif.

MR. Z. STOKOWIEC has been appointed General and Technical Manager to Leopold Lazarus, Ltd., Birmingham.

MR. J. P. WARNER has left the University of British Columbia to become Economist with Sherritt-Gordon Mines, Ltd., Fort Saskatchewan, Alberta.

DR. J. B. WILSON has relinquished his post as Deputy Development Manager at Magnesium Elektron, Ltd., to become Chief Engineer at English Racing Automobiles, Ltd., Dunstable, Beds.

MR. K. J. B. WOLFE has left B.S.A. Tools, Ltd., and joined the Triplex Safety Glass Co., Ltd.

PROFESSOR DR.-ING. A. VON ZEERLEDER has been awarded the honorary degree of Dr. rer. nat. of the Technische Hochschule, Stuttgart.

OBITUARY

Mr. Howard Evans

We regret to announce the sudden death, on 11 September, of Mr. Howard Evans, A.Met., F.I.M., Superintendent of the Research Laboratory of The Mond Nickel Co., Ltd., Birmingham.

Mr. Evans was born in 1907 and, after studying metallurgy at Sheffield University, where he graduated A.Met. with the award of the Mappin Medal and Premium in 1930, he was employed in the Research Department of the Metropolitan-Vickers Electrical Co., Ltd., Manchester.

In 1938 Mr. Evans joined the Development and Research Department of The Mond Nickel Co., Ltd., as Research Metallurgist in their Birmingham Laboratory. In 1945 he was appointed Principal Assistant to the Superintendent, and in May 1954 Superintendent of the Laboratory in succession to Mr. H. W. G. Hignett. In these capacities he was associated with a wide variety of research projects in both the ferrous and non-ferrous fields.

He was elected a Fellow of the Institution of Metallurgists in 1946, and was a member of the Iron and Steel Institute, the Institute of Metals, and other societies. During the year 1954-55, he was President of the Birmingham Metallurgical Society. He leaves a widow and a daughter.

NEWS OF KINDRED SOCIETIES

Indian Institute of Metals

The Ninth Annual General Meeting of the Indian Institute of Metals will be held in Calcutta on 20-22 December 1955. The programme will include the Presidential Address, technical meetings, a film show, works visits, &c.

The Second Educational Lecture Series on the "Mechanical and Physical Properties of Steel" will also be given in conjunction with the Annual Meeting, and Dr. J. C. Ghosh will deliver the Fourth Pandya Memorial Lecture on "Problems of Fuel and Power in India".

OTHER NEWS

Conference on Semi-Conductors

As part of the Spring Meeting of the Physical Society, the British Thomson-Houston Co., Ltd., is organizing a Conference on Semi-Conductors, to be held at Ashorne Hill, Leamington Spa, on 10, 11, and 12 April 1956. On 11 April there will be a visit to the Company's Research Laboratory at Rugby.

Preliminary application forms may be obtained from Miss E. Miles, The Physical Society, 1 Lowther Gardens, Prince Consort Road, London, S.W.7.

International Conference on Electron Microscopy

In connection with the Liège International Fair, to be held in May 1956, the Association des Ingénieurs sortis de l'Ecole de Liège is organizing a Conference on the Industrial Applications of Electron Microscopy.

The Conference is expected to cover: (1) the development of the instruments and methods used in electron microscopy; (2) the contribution of electron microscopy to the metallography of ferrous and non-ferrous metals and also to the physics of the solid state; and (3) the development of some special aspects of the applications to chemistry. An exhibition is being arranged in conjunction with the Conference.

Details may be obtained from the Secrétariat Général de l'Association des Ingénieurs sortis de l'Ecole de Liège, 22, rue Forgeur, Liège, Belgium.

Conference on Lubrication and Wear

1-3 October 1957

The Council of the Institution of Mechanical Engineers are arranging a Conference on Lubrication and Wear to be held in London from Monday, 1 October to Wednesday, 3 October 1957 inclusive. Meetings for the presentation of papers will be held each day, as much time as possible being allowed for discussion. It is hoped to obtain papers covering the whole field of lubrication and wear.

The Council desire that the published Proceedings of the Conference shall constitute a useful reference work, and to this end they will ensure that careful discrimination is shown in the choice of subject-matter. They invite both members and non-members of the Institution to contribute papers to the Conference. Each contribution will be treated on its merits, but the Council wish to emphasize that, even if a paper is accepted in principle as regards the subject covered, it may have to be modified after initial drafting to fit into the general framework of the Conference. In order to avoid unnecessary work, therefore, intending authors are invited to

submit, in the first instance, a brief synopsis of, say, 200 words, setting out the proposed title and contents of their contributions. These should be received by the Secretary of the Institution at the latest by 1 April 1956, but notification before this date of intention to submit a synopsis would be very helpful. The Council will then be able to review the contributions in the light of the number received and the fields covered by them. The Council will furnish every assistance to those authors invited to write papers as a result of consideration of the synopses submitted by them. It is likely that the final manuscripts will be limited to a maximum length of 3000 words. Illustrations will be permitted. Further information may be obtained on request from the Secretary of the Institution, 1 Birdcage Walk, London, S.W.1.

Copies of the papers will be available before the Conference, and the Proceedings, including the papers and discussion, will be published by the Institution in due course.

DIARY

Local Sections and Associated Societies

- 17 November. **Liverpool Metallurgical Society.** "High-Purity Alloys of Iron", by Dr. N. P. Allen. (Liverpool Engineering Society, 9 The Temple, Dale Street, Liverpool, at 7.0 p.m.)
- 23 November. **Manchester Metallurgical Society.** "Some Metallurgical Problems Imposed by Stratospheric Flight", by Major P. Litherland Teed. (Lecture Room of the Central Library, Manchester, at 6.30 p.m.)
- 24 November. **Birmingham Local Section.** "The Presentation of Metallurgical Information", by Dr. J. W. Jenkin. (James Watt Memorial Institute, Great Charles Street, Birmingham 3, at 6.30 p.m.)
- 1 December. **Birmingham Local Section.** Students' Evening. (Birmingham Exchange and Engineering Centre, Stephenson Place, Birmingham, at 6.30 p.m.)
- 1 December. **Leeds Metallurgical Society.** "Radiation Damage in Metals", by Dr. W. M. Lomer. (Large Chemistry Lecture Theatre, The University, Leeds 2, at 7.15 p.m.)
- 6 December. **Oxford Local Section.** "Applications of the Dislocation Theory to Work-Hardening", by Professor A. H. Cottrell. (Cadena Café, Cornmarket Street, Oxford, at 7.0 p.m.)
- 6 December. **Sheffield Local Section.** "Production Control Quantometer for Steelworks Analysis", by D. Manterfield and W. Sykes. (British Iron and Steel Research Association, Hoyle Street, Sheffield, at 7.0 p.m.)
- 6 December. **South Wales Local Section.** "Refractories and Fluxes", by Dr. J. White. (Department of Metallurgy, University College, Swansea, at 6.45 p.m.)
- 7 December. **Manchester Metallurgical Society.** "Forging Research at the British Iron and Steel Research Association", by P. M. Cook. (Lecture Room of the Central Library, Manchester, at 6.30 p.m.)
- 8 December. **Liverpool Metallurgical Society.** "Some Aspects of Electroplating Relative to Industrial Applications". (Joint Meeting with the North-West Branch of the Institute of Metal Finishing.) (Liverpool Engineering Society, 9 The Temple, Dale Street, Liverpool, at 7.0 p.m.)
- 8 December. **North East Metallurgical Society.** "Commercial Zinc Coatings and Their Performance", by R. W. Bailey. (Cleveland Scientific and Technical Institute, Middlesbrough, at 7.15 p.m.)

Price List of Publications

Note.—Prices quoted in dollars, for the convenience of American and Canadian purchasers, include an allowance for charges for collection of cheques. Customers' cheques on their American or Canadian banks will be accepted.

TITLES AND AUTHORS	Published Price Post Free		Price to Members (one copy each) Post Free		Booksellers' and Library Rate Post Free	
	£	s. d.	\$	£	s. d.	\$
<i>Monthly</i>						
JOURNAL OF THE INSTITUTE OF METALS WITH THE BULLETIN AND METALLURGICAL ABSTRACTS. 12 monthly issues plus proceedings and index issue and binding cases	9	0 0	25.65	4 10 0	13.00	7 10 0 21.45
<i>Cloth-Bound</i>						
JOURNAL OF THE INSTITUTE OF METALS						
Volumes 1-65 (1909-1939), per vol.	1	10 0	4.50	15 0	2.50	1 5 0 3.75
Volumes 66-83 (1940-1954/5), per vol.	3	0 0	9.00	1 10 0	4.50	2 10 0 7.50
Volume 84 (1955/6), per vol. onwards	4	10 0	13.00	2 5 0	6.75	3 15 0 11.00
<i>(Note.</i> —The General Indexes to the "Journal", Vols. 1-25 and 26-63 are out of print.)						
METALLURGICAL ABSTRACTS (New Series), Annual						
Volumes 1-22 (1934-1954/5), per vol.	3	0 0	9.00	1 10 0	4.50	2 10 0 7.50
Volumes 23 (1955/6), per vol. onwards	4	10 0	13.00	2 5 0	6.75	3 15 0 11.00
<i>(Important Note.</i> —Vols. 7-10, inclusive (1940-1943), can only be supplied in a set of Vols. 1-10, with General Index; and Vol. 12 (1945) can only be supplied in a set of Vols. 11-20 (1944-1953).)						
GENERAL INDEX TO METALLURGICAL ABSTRACTS. Volumes 1-10 (1934-1943)						
In 2 volumes, per set	5	5 0	15.15	4 4 0	12.20	4 7 6 12.70
<i>MONOGRAPH AND REPORT SERIES (Cloth-Bound)</i>						
No. 1.—THE STRUCTURE OF METALS AND ALLOYS. By W. Hume-Rothery and G. V. Raynor. Third edition, greatly enlarged (1954)	1	15 0	5.50	17 6	3.00	1 9 2 4.50
No. 2.—THE CONSTITUTIONAL DIAGRAMS OF ALLOYS: A BIBLIOGRAPHY. By J. L. Haughton. Second edition by A. Prince (<i>in the press</i>)	...	...	...	...	...	...
No. 3.—ATOMIC THEORY FOR STUDENTS OF METALLURGY. By W. Hume-Rothery. Second edition, revised (1955)	1	10 0	4.50	15 0	2.50	1 5 0 3.75
No. 4.—AN INTRODUCTION TO THE ELECTRON THEORY OF METALS. By G. V. Raynor. Third printing (1953)	10	6	2.00	5 3	1.15	8 9 1.65
No. 7.—THE SOLIDIFICATION OF CASTINGS: A REVIEW OF THE LITERATURE. By R. W. Ruddle. (<i>Second edition in preparation</i>)	...	...	...	...	...	...
No. 10.—THE NON-DESTRUCTIVE TESTING OF METALS. By R. F. Hanstock (1951)	1	1 0	3.50	10 6	2.00	17 6 2.90
No. 11.—THERMODYNAMICS OF ALLOYS. By J. Lumsden (1952)	1	15 0	5.50	17 6	3.00	1 9 2 4.50
No. 13.—PROPERTIES OF METALLIC SURFACES (1953)	1	15 0	5.50	17 6	3.00	1 9 2 4.50
No. 14.—EQUIPMENT FOR THE THERMAL TREATMENT OF NON-FERROUS METALS AND ALLOYS (1953)	15	0	2.50	7 6	1.50	12 6 1.95
No. 15.—THE CONTROL OF QUALITY IN THE PRODUCTION OF WROUGHT NON-FERROUS METALS AND ALLOYS. VOL. I.—THE CONTROL OF QUALITY IN MELTING AND CASTING (1953)	15	0	2.50	7 6	1.50	12 6 1.95
No. 16.—THE CONTROL OF QUALITY IN THE PRODUCTION OF WROUGHT NON-FERROUS METALS AND ALLOYS. VOL. II.—THE CONTROL OF QUALITY IN WORKING OPERATIONS (1954)	15	0	2.50	7 6	1.50	12 6 1.95
No. 17.—THE CONTROL OF QUALITY IN THE PRODUCTION OF WROUGHT NON-FERROUS METALS AND ALLOYS. VOL. III.—THE CONTROL OF QUALITY IN HEAT-TREATMENT AND FINAL OPERATIONS (1955) (<i>in the press</i>)	15	0	2.50	7 6	1.50	12 6 1.95
No. 18.—THE MECHANISM OF PHASE TRANSFORMATIONS IN METALS (<i>in the press</i>)	...	...	...	...	...	...
No. 19.—THE RUNNING AND GATING OF SAND CASTINGS: A REVIEW OF THE LITERATURE. By R. W. Ruddle (<i>in the press</i>)	...	...	...	...	...	...
<i>(Note.</i> —Monographs Nos. 5, 6, 8, 9 and 12 are now out of print.)						
<i>ANNOTATED EQUILIBRIUM DIAGRAMS</i>						
No. 1—Al-Zn; No. 2—Cu-Sn; No. 3—Cu-Zn; No. 4—Al-Cu; No. 5—Al-Mg; No. 6—Pb-Sn; No. 7—Be-Cu; No. 8—Fe-Zn; No. 9—Sb-Pb; No. 10—Cu-Ag; No. 11—Fe-Ni; No. 12—Cd-Zn, each	2	0	0.50	1 0	0.40	1 8 0.40
<i>In the press:</i> No. 13—Al-Fe; No. 14—Al-Sn; No. 15—Al-Sb; No. 16—Al-Si; No. 17—Al-Mn; No. 18—Al-Ni; No. 19—Al-Be; No. 20—Al-Co; No. 21—Al-Ag; No. 22—Al-Ti.						

DISCOUNT FOR SERIES

A discount of 10% on the prices of the *Journal* or *Metallurgical Abstracts* will be allowed on all orders of 10 volumes or more (including index volumes), and a discount of 25% will be allowed for complete sets.

- 12 December. Scottish Local Section.** Films presented by Frank Hudson. (39 Elmbank Crescent, Glasgow, C.2, at 6.30 p.m.)
- 14 December. London Local Section.** "Practical Implications of Research on the Casting of Non-Ferrous Metals", by E. C. Mantle. (Joint meeting with the London Branch of the Institute of British Foundrymen.) (Waldorf Hotel, Aldwych, London, W.C.2, at 7.30 p.m.)

Other Societies

- 15 November. Institute of British Foundrymen, East Anglian Section.** "Castings Defects", by J. L. Francis. (Lecture Hall, Public Library, Old Foundry Road Entrance, Ipswich, at 7.30 p.m.)
- 16 November. Institute of British Foundrymen, London Branch.** "Production of Cores and Moulds in British Foundries by the CO₂ Process", by A. Tipper. (Waldorf Hotel, London, W.C.2, at 7.30 p.m.)
- 17 November. Chemical Society, Bristol Branch.** "Principles of Crystal Growth", by Professor F. C. Frank. Joint Meeting with the Royal Institute of Chemistry and the Society of Chemical Industry. (Chemistry Department, The University, at 7 p.m.)
- 17 November. Institution of Mining and Metallurgy. General Meeting.** (Geological Society, Burlington House, Piccadilly, London, W.1, at 5.0 p.m.)
- 18 November. Institution of Mechanical Engineers.** Thomas Hawksley Lecture: "Properties of Matter at High Pressures", by Professor D. M. Newitt. (1 Birdcage Walk, London, S.W.1, at 5.30 p.m.)
- 18 November. Society of Chemical Industry, Corrosion Group.** Symposium on "The Protection of Cable Sheathing". (Institution of Electrical Engineers, Savoy Place, London, W.C.2, at 10.0 a.m. and 2.30 and 5.15 p.m.)
- 18 November. West of Scotland Iron and Steel Institute.** "The Metallurgy of Nuclear Power Production", by Dr. A. B. McIntosh. (39 Elmbank Crescent, Glasgow, C.2, at 6.45 p.m.)
- 22-25 November. International Congress on the Documentation of Applied Chemistry.** (Lecture Theatre of the Institut Français du Royaume Uni, Queensberry Place, London, S.W.7.)
- 24 November. Institute of British Foundrymen, Northampton Section.** "Cores and Moulds by the CO₂ Process", by A. Talbot. (Plough Hotel, Northampton, at 7.30 p.m.)
- 24 November. Institute of British Foundrymen, Southampton Section.** "Recent Developments in High-Chromium Cast Iron", by H. P. Hughes and J. Monghan. (Technical College, St. Mary's Street, Southampton, at 7.30 p.m.)
- 25 November. Institution of Mechanical Engineers.** "Developments in Mechanized Welding in the Aero-Engine Industry", by F. G. C. Sandiford. (1 Birdcage Walk, London, S.W.1, at 5.30 p.m.)
- 29 November. Institute of Welding, Slough Section.** "Recent Developments in the Argon Process", by A. W. Stones. (Lecture Room, The Community Centre, Farnham Road, Slough, Bucks., at 7.30 p.m.)
- 29 November. Institution of Engineers and Shipbuilders in Scotland.** "Fatigue Research at the Mechanical Engineering Research Laboratory", by C. E. Phillips. (39 Elmbank Crescent, Glasgow, C.2, at 7.30 p.m.)

- 6 December. East Midlands Metallurgical Society.** "Surface Effects in Fatigue", by B. Hall. (Nottingham and District Technical College, Shakespeare Street, Nottingham, at 7.30 p.m.)
- 6 December. Institute of British Foundrymen, Slough Section.** "Modernization of a Small Foundry", by R. Blandy. (Lecture Theatre, High Duty Alloys, Ltd., Slough, at 7.30 p.m.)
- 7 and 8 December. Institute of Welding, &c.** Symposium on "The Use and Welding of Aluminium in Shipbuilding". (Weir Lecture Hall, Institution of Naval Architects, 10 Upper Belgrave Street, London, S.W.1, 10.0 a.m. and 2.30 p.m. each day.)
- 8 December. Institute of British Foundrymen, Beds./Herts. Section.** "Production of Moulds and Cores by the CO₂ Process", by A. Talbot. (Small Assembly Room, Town Hall, Luton, at 7.30 p.m.)
- 8 December. Institute of Welding, South London Branch.** "Measuring Productivity in Welding—A New Approach with Applications to Management", by A. G. Thompson. (2 Savoy Hill, London, W.C.2, at 6.30 p.m.)
- 13 and 14 December. British Welding Research Association.** "Increasing Productivity by the Use of Welding". (The Lesser Free Trade Hall, Manchester, at 9.30 a.m. and 2.30 p.m. each day.)
- 14 December. Society of Chemical Industry, Corrosion Group.** "Chromate Pigments for Metal Protection", by H. G. Cole. (Joint meeting with the Organic Finishing Group of the Institute of Metal Finishing.) (Chemical Society, Burlington House, Piccadilly, London, W.1, at 6.30 p.m.)
- 15 December. Institution of Mining and Metallurgy.** General Meeting. (Geological Society, Burlington House, Piccadilly, London, W.1, at 5.0 p.m.)

APPOINTMENTS VACANT

ALUMINIUM LABORATORIES LIMITED, BANBURY require a number of graduates and technicians to work on the following problems:

Metallurgical problems concerned with the continuous casting of aluminium.

Development of new alloys, including studies of diffusion, constitution, the properties of intermetallic phases, and the influence of these phases on the properties of the aluminium matrix.

Problems of physical metallurgy and in particular recrystallization.

Chemical and physical problems such as the measurement of particle size, surface tension, and viscosity, and the properties of surface films.

The development of non-destructive testing methods, and in particular the study of the effect of variations in the constitution and structure of aluminium alloys on their physical properties.

The application of the theory of thermal transfer.

The study of recrystallization of aluminium alloys by means of measuring changes in their damping capacity at elevated temperatures.

Electrochemical problems relating to metal finishing.

The study of aluminium paste pigment.

Chemical problems concerned with metal-working lubricants and with the development of analytical methods.

The work is interesting and progressive, and provides unusual opportunities for men with initiative and enthusiasm to perform original research, which may be suitable for publication. The laboratories are situated in pleasant country surroundings and have recently been extended. The salaries will be attractive and in accordance with age and experience. A pension scheme is in operation. Applications should be addressed to: The Director of Research, Aluminium Laboratories Limited, Banbury, Oxon.

MAGNESIUM ELEKTRON, LTD.

Magnesium Elektron, Ltd., require an experienced Development Engineer for their works near Manchester. Duties will involve the development of applications and of methods of production of wrought magnesium alloys for aircraft and other industries. Applicants should be between 25 and 35 and possess good engineering degree or equivalent. They should be energetic, of an adaptable nature, and have a strong personality with common sense and a practical outlook. Experience in the aircraft or motor industry would be an advantage. Salary would be according to qualifications and experience but not less than £900 per annum. Contributory pension scheme embodying life assurance. Apply, quoting IM.JL29, to Secretary, Magnesium Elektron, Ltd., P.O. Box No. 6, Lumm's Lane, Clifton Junction, Swinton, Manchester.

**METALLURGISTS FOR
ATOMIC POWER PROGRAMME**

Physical Metallurgists are required for senior appointments in a new research and development group. These positions require young men with good honours degree or Ph.D. qualifications. Applications for interview should be addressed to:

The Personnel Manager,
Fraser & Chalmers Engineering Works,
Erith,
Kent.

METALLURGISTS required for control and development of works processes, including casting, rolling, extruding, heat-treatment of aluminium and aluminium alloys. Applicants should not be over 30 years of age, and must be graduates in metallurgy. Please write, giving full details of career and salary expected, to Personnel Manager, Northern Aluminium Co., Ltd., Banbury, Oxon.

NORTHAMPTON POLYTECHNIC

St. John Street, London, E.C.1

Applications are invited for RESEARCH ASSISTANT in the Civil and Mechanical Engineering Department for work in FATIGUE OF METALS. Applicants should have degree in Engineering or Metallurgy, or equivalent qualifications. Post will provide opportunity to work for higher degree. Remuneration £400 per annum, with additional payment for any teaching duties undertaken. Further particulars obtainable from Mr. J. C. Oakden, Head of Department.

QUALIFIED ENGINEER or METALLURGIST required for research work on fatigue and general properties of high-grade engineering materials in Research Laboratory situated in West London area. Excellent prospects for keen and enthusiastic young man above 25 years of age. Commencing salary of at least £800 per annum for a suitable applicant. Pension Scheme and five-day week. Apply to Box No. 396, The Institute of Metals, 4 Grosvenor Gardens, London, S.W.1, quoting reference 45/L.

RESEARCH METALLURGIST required by British Insulated Callender's Cables, Ltd., at their Shepherds Bush Laboratories. The successful applicant, who should have an Honours Degree in metallurgy and preferably some experience of metallurgical research, is required for work on the various problems connected with the cable-making industry. The laboratory is engaged on a wide range of research problems associated with the Company's large-scale processing and utilization of non-ferrous metals, and the post offers good prospects for advancement. Every opportunity will be given for visiting the Company's factories and becoming thoroughly familiar with its metallurgical processes. Five-day week. Pension Fund. Apply, giving full particulars of age, qualifications, and experience, to Staff Officer, BICC, Ltd., 21 Bloomsbury Street, London, W.C.1, quoting reference L/97/54.

THE BRITISH IRON & STEEL RESEARCH ASSOCIATION. PHYSICAL METALLURGIST required by the above Association to work in a Research Group concerned with measurements of fundamental properties of iron and steel, e.g. diffusion and the effects of small amounts of impurities. A University degree or equivalent qualification is essential. Some postgraduate research experience or industrial experience would be an advantage, but is not essential. Results of the work would be suitable for submission for a higher degree. Applicants should preferably be within the age range 22-27, for which the salary would be within the range £550-£800 p.a. Consideration might be given to exceptional applicants outside these ranges. The post is superannuated under F.S.S.U. and the location of work is Sheffield. Written applications only, quoting "M.G.I.", to Personnel Officer, B.I.S.R.A., 11 Park Lane, London, W.1.